

3

PHILOSOPHIC
O D E
ON THE
S U N
AND THE
UNIVERSE.

*Alme Sol, curru nitido diem qui
Promis et celas, aliisque et idem
Nasceris, possis nihil urbe Romæ
Visere majus!*

Hor. Carm. Sæc.

L O N D O N:

Printed for J. PAYNE, and J. BOUQUET, at the *White-
Hart*, in *Pater-noster-Row*.

M.DCCCL.

PHILOSOPHIC

D E

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UNIVERSITY



L O N D O N

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INTRODUCTION.



HERE a Man introduced into the World at once, with all the powers and faculties of his soul in full vigour and perfection, how would he be astonish'd on surveying the magnificent scene of things before him ; the Earth, the Air, the Seas, the azure vault of Heaven, the almost infinite variety of plants and animals, the glorious regent of the day bountifully dispensing light and heat to all around, the silver queen of night, and all the host of Heaven passing nightly in review before him. But how would his admiration rise, if he should further be made

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made acquainted with the discoveries of the Telescope, the Microscope, and the Prism; when he should sometimes be obliged to stretch his imagination to the utmost, to conceive the immensity of the great whole, and soon again contract it to attend to the imperceptible minuteness, the surprizingly-fine and subtil texture, the amazingly-wise and apposite disposition of its constituent parts; would he not in awful transport cry out with the Psalmist, *Great and marvellous art, thou O Lord! in all thy Ways, and wonderful in all thy Works!*

But as the human understanding opens gradually, this stupendous scene becomes familiar before the understanding is mature: and when men have arrived at maturity, their lives, their reason, all the powers of their souls, are so engross'd in providing the necessities of life, or in supplying the wants of luxury, they are either so totally involved in business, or immers'd in pleasures, that few ever set apart one single hour for

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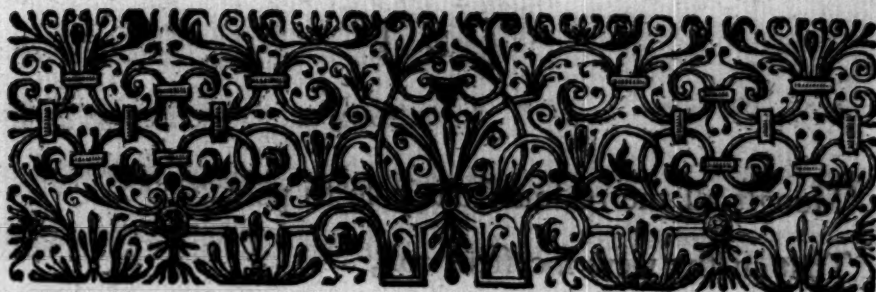
contemplating the wonders of nature; add to this, that many persuade themselves that such speculations are too sublime, difficult and abstruse, and, besides, of no great use or advantage. Hence it is that those momentous truths, those shining precepts, so legibly and distinctly wrote in the great volume of nature, are so little attended to, and lose so much of their force and impression.

Now I have thought that the comprising a clear and succinct idea of the universe in a little poem, and interspersing some late discoveries therein, might be a means of gaining the attention of mankind, and of exciting them to serious contemplation: and a frequent and profound meditation upon the wonderful phenomena of the Universe cannot fail of making a deep impression, so deep, that I should think it impossible for Men, accustomed to such meditations, to open their eyes to let in the light, without letting in, at the same time, an awful

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awful idea of the majesty, goodness and omnipresence of the great Creator, than which nothing can more effectually contribute to the eradicating the profaneness and debauchery, the impiety and immorality, with which this devoted nation is at present over-run.





O D E
O N T H E
S U N.

RADIANT Sovereign of the day!
Whose swift, whose all-enlivening ray
Dispels the gloom of night;
Whose fulgent orb new life imparts,
Fills every eye, all grateful hearts,
With rapture and delight:

B 'Mongst

Line 1, 2.] The distance of the Sun from the Earth is about 81,000,000 of miles, which space light moves over in 8¹/₁₃". Sun's diameter is about 700,000 miles. He revolves round his axis in a-

bout 25 days. Spots are frequently discover'd in him; he appears bigger, and is nearer the Earth in Winter than in Summer, and is about 116 times bigger than all the planets put together.

'Mongst all the realms from pole to pole,
That in thy view incessant roll,
Distinguish *Britain's* isles.

Here liberty, and arts, and arms,
And beauty's all-commanding charms
Deserve thy choicest smiles.

12

Oh! did fair *Virtue's* influence shine
But half so warm, so bright as thine,
How would this land be blest!

But see the lovely Goddess mourns,
Asham'd to see *Britannia's* sons
By motley vice deprest.

18

Do thou illumine my rising breast,
In all thy glories stand confest,
And all thy pow'rs reveal!

Be

Be thou my *Muse*, in every line

Let thy inspiring ardor shine,

Let me thy presence feel!

Thou wak'st the flow'ry pride of spring,

Thou giv'st the feather'd race to sing,

And Nature's life restores :

From thee the vine's rich juices flow,

To thee the golden grain we owe,

Nurs'd by thy genial pow'rs.

In living green thou rob'st the earth,

And giv'st her rich embroid'ry birth,

That *India's* gems outvies;

Thy vivid colours yonder glow

In that wide-stretch'd cœlestial bow,

Great *Titian* of the skies!

36

B 2

Thou

Line 35.] The Sun-beams refracted and reflected by the drops of rain in a falling shower from the rainbow.—The

center of the Sun, the center of the bow, and the eye of the spectator are always in a right line.

Thou lay'st enamel on the meads,

And all the rich profusion spreads

That blows in each parterre :

The rose's red, the violet's blue,

The tulip's variegated hue

Thy painting rays confer: 42

Thine are the tints that paint the east,

All thine the glories of the west,

That strike us with delight,

When fragrant morn's refreshing pow'rs,

Or milder evening's peaceful hours

To verdant meads invite. 48

Thine

Thine are the charms that flush the face;

Thine every eye-delighting grace, 50

That makes the lover gaze :

Those light'nings, that resistless fly

From lovely *Delia's* sparkling eye,

Are thy reflected rays. 54

Nor yet to scanty Earth alone

Is thy free bounteous favour shown,

Or only for her sake ;

For

Line 49] This and the preceding verses are design'd to inculcate that great discovery of Sir *Isaac Newton's*, that the Sun is the great source and fountain of colours. Let not the ladies quarrel with me, and imagine that this doctrine robs them of their beauty. If their faces have a power of separating and reflecting a charming assemblage of colours, 'tis the same thing as if the roses and the lillies actually inhered and grew there: Their

charms are as much their own upon one supposition as upon the other. 'Tis more than probable that not only the different colours, but all the other different qualities of material objects arise from their texture; that the first or original particles of all sorts of matter are the same, and that the diversification of bodies arises only from the different modification and composition of these first particles.

For other beings, other spheres,
Thy wide-extending influence share,
Thy cheering warmth partake.

All those vast globes which thee attend,
And on thy warmth and light depend,
What secret power retains?

Their various orbits who inclin'd?
Their periods, distances, assign'd?
Their forces, laws, sustains?

There MERC'RY close-attending stays,
Scarce e'er emerges from thy blaze

To unassisted sight :

Line 64.] The Planets don't move all in the same plane. *Mercury's* orbit is inclin'd to the plane of the ecliptic in an angle of $7^{\circ} 0'$ —The inclination of *Venus's* orbit is $3^{\circ} 24'$ —of *Mars's* $1^{\circ} 52'$ —of *Jupiter's* $1^{\circ} 20'$ —of *Saturn's* $2^{\circ} 30'$. The inclinations of the orbits of all comets are very great, so that the planets are less liable to be disturb'd by them.

Line 67.] *Mercury* revolves round the Sun in 88 days; he is so near the Sun, that the time of his rotation upon his axis has not yet been observ'd. His diameter is only 1588 parts of that of the Sun; he is never farther than 28 degrees remov'd from the Sun; sometimes passes over the Sun's disk, appearing like a black spot in the Sun.

Next

Next lucid VENUS round thee whirls,
 Her changing orb now wanes now fills,
 The beauty of the night. 72

Here EARTH, and her attendant MOON,
 Their annual race around thee run,
 By strong attraction ty'd ;

Yet

Line 70.] *Venus* revolves round the Sun in $224\frac{1}{2}$ days, round her axis in 23 hours (or, according to *Bianchini*, in 24 days 8 hours). She has phases like the Moon; her diameter is $\frac{1}{108}$ parts of that of the Sun; her greatest elongation from the Sun exceeds not 48 degrees.—When she appears brightest, we see not above $\frac{1}{2}$ of her lucid disk. Sometimes she appears like a spot in the Sun; she did so in 1639, and will again pass over the Sun in May 1761; when, if astronomers are accurate and careful in their observations, the distance of the Earth from the Sun may be determined to within $\frac{1}{100}$ part of the whole.

Line 73.] The Earth revolves round the Sun in 365 days 5 hours 49 minutes, round her axis in 24 hours; her diameter is about $\frac{1}{108}$ parts of that of the Sun, or 8000 miles; distance from the Sun about 81 millions of miles: but this will be more

exactly known in 1761. The distance of the Earth from the Sun being once settled, and the periodical times of the other Planets being known, their several distances may be found by means of the general law which regulates their motions, and is hereafter mentioned.

The Earth's satellite, the Moon, is 240,000 miles distant from the Earth; her diameter is about $\frac{1}{28}$ parts of that of the Earth; she compleats one entire revolution in her orbit in 27 days 7 hours, which is called a *periodical Revolution*; but 29 $\frac{1}{2}$ days elapse between one conjunction and another, which space of time is called a *synodical Month* or *Revolution*. The same face of the Moon is always turned towards the Earth, and consequently she turns upon her axis in the same time that she revolves round the Earth, that is, in 27 days 7 hours.

Yet often, in their social course,
 Each closes up thy lucid source,
 And each thy glories hide. 78

Red fiery MARS, the next in place,
 In æther's unresisting space
 Alone performs his rounds,
 The great, the belt-encircled Jove
 Swiftly beyond is seen to move,

With twice two social Moons. 84

To

Line 79.] Mars turns round the Sun in 1 year 322 days, upon his axis in 24 hours 40 minutes—His diameter is $\frac{1}{1000}$ parts of that of the Sun.

Line 82.] Jupiter revolves round the Sun in 11 years 315 days round, his axis in 9 hours 56 minutes; his diameter is $\frac{1}{1000}$ parts of that of the Sun. He has 4 Moons, or Satellites; the first, or nearest whereof revolves round him in 1 day 18½ hours. The second circulates in 3 days 13½ hours; the third compleats a revolution in 7 days 3¼ hours;

the fourth in 16 days 16½ hours. These Satellites pass sometimes behind Jupiter, sometimes over him. The observation of the times of their immersion and emersion, or of their entering upon or behind Jupiter's body, or disk, and getting clear of it again, is of great use in determining longitudes. For, by comparing the observed times with the times mentioned in tables calculated for any place whose longitude is known, we get the difference in time between the two places, which is the difference of longitude.

To this thy vast, thy wide domain,
 The ring-surrounded SATURN's reign
 Assigns the bounding line.
 Five Moons, the leaden planet nigh,
 Thy much-enfeebled light supply,
 And on his natives shine.

C

All

Line 86.] *Saturn* revolves round the Sun in 29 years and 166 days; he is so remote, that the time of his rotation upon his axis has not yet been observed. His diameter is $1\frac{1}{3}$ parts of that of the Sun; his first Satellite revolves round him in 1 day $21\frac{1}{2}$ hours; his 2d in 2 days $17\frac{1}{2}$ hours; the 3d in 4 days $12\frac{1}{2}$ hours; the 4th in 15 days $22\frac{1}{2}$ hours; the 5th in 79 days $7\frac{1}{2}$ hours. The thickness of his ring is not great; its breadth is about equal to half his diameter.

Line 90.] That all the Planets are inhabited is an establish'd article of the astronomical creed, with me at least it is: The bulk of mankind nevertheless look upon this as a mere fancy and chimaera, as an extravagant reverie of overfond and over-credulous mathematicians. But credulity is not the foible of mathematicians; let us hear what they have to say in defence of this opinion. There are 6 Planets, which all revolve round

the Sun, and round their own axis; three of them are nearly equal in bulk to the Earth, two of 'em are several hundred, nay thousand times larger. The Earth, we know, is inhabited; we know too that the final cause of its revolution round the Sun and its own axis, is to produce the vicissitudes of day and night, of summer and winter, for the convenience of its inhabitants. May we not then, by parity of reason, fairly conclude that the end and design of the revolutions of all the other Planets is the same? Is not this agreeable to that beautiful harmony, and uniformity of design which obtains in the universe? But it has been said that the Planets, and all the hosts of Heaven were created to manifest the power of the creator to man. That this is an effect of this grand and magnificent fabric is agreed, but that it was the final cause of its creation, *Credat Judeus Apella*.—To establish this opinion yet

All these to mortals Wand'ers seem,
But undeserving such a name

Is even the Comets' course:

One general law they all obey,
All steadfast keep th' appointed way,

And yield to impress'd force. 96

When

yet more firmly, let me ask objectors a few questions. The Satellites, or Moons of *Jupiter* and *Saturn* are not perceptible by the naked eye, and known only to a few; and it will be readily granted that the Earth's Satellite, the Moon, is design'd to give light to the Earth in the absence of the Sun. Now are not the Moons of *Jupiter* and *Saturn* probably design'd for the same purpose? Do we not see that the more remote a Planet is from the Sun, the greater apparatus it has for this purpose? *Jupiter* has 4, *Saturn* 5 Moons, and a Ring besides, all probably intended to supply the light, and perhaps to encrease the heat of the Sun. Now if *Jupiter* and *Saturn* be not inhabited, to what end is all this care, all these wonderful contrivances to supply them with light and heat? But what reason is there to suppose the Planets uninhabited? Is there any thing but *human Pride* to induce men to be-

lieve that all those millions of Suns (in comparison with the least of which this Earth is but a point, an atom) are only so many brilliants to embellish the azure mantle of night, and to form a rich and superb canopy for the lord of this globe? Good heavens! how ridiculous is the vanity of this human reptile! not content with lording it over this spot of Earth, he must needs arrogate the homage of the universe, and refer all things to himself as to their ultimate and final cause!

[Line 94.] The great *Kepler* first discover'd that the Planets move round the Sun, so as to describe areas proportional to the times; and also that the squares of their periodical times are in proportion to each other as the cubes of their distances: But the greater Sir *Isaac Newton* first fully illustrated and demonstrated these two laws or theorems.

When devious Comets swift descend,
To thee their oblique course they bend,
To renovate their fire ;

Line 97] The number of Comets belonging to this solar system is not known, perhaps never will be: We know nothing at all of the Comets of the southern hemisphere, or those whose aphelia are in the regions of the heavens south of the ecliptic. We have a list of 24 or 25 of the northern Comets which have been observed, but there may be many more of them; for if, when a Comet enters within the limits of our system, the position of its orbit with respect to the Earth be such, that a line drawn from the Earth to the Comet and continued, terminates in the Sun, or in those parts of the heavens near the Sun, 'tis plain the Sun's vicinity and superior lustre will hinder its being visible: Many Comets therefore may have visited us, and departed unobserved; many, which formerly were invisible, may at their next visit make a signal and splendid appearance; and others, which have formerly terrified mankind, may at their next return be invisible.

The obliquity or inclination of the orbits of Comets to the plane of the ecliptic (in or near which plane all the Planets move) is so great, that the motions of the regular Planets are not liable to be disordered and disturbed by comets, or irregular Planets, as they would otherwise have been. But yet every Comet in its way to and from the Sun passes the plane of the ecliptic in two

places, and therefore the time may come when a Comet may approach so nigh the Earth, as that the two globes may rush together with inconceivable violence and force. In such a case, the whole surface of this globe would be consum'd in a moment; magnificent palaces, and opulent cities, haughty potentates, and their numerous subjects, all the works of art, all the productions of nature, Earth and seas, with all their various tribes of plants and animals, would be involv'd in one common ruin, in the twinkling of an eye would be converted into a vast cloud of vapour, dust and smoke. Not would the ruins of the mighty fabric receive the honour of a common obsequies, they would not be entomb'd in a grave, or inclos'd in an urn, but would be wildly tossed and agitated round the solid burning mass, just as furious blasts, or devouring flames impell'd them; whilst such parts of this globe, whose density prevented their dissipation, would coalesce, and be united to the Comet, and the new-form'd globe would strike out a new path in the ethereal regions. And yet, awful and tremendous as this dreadful union seems to us little mortals, it would be with respect to the universe a trifling event, of no more importance than the collision of two falling drops of rain is with respect to this earthly globe.

Then with a lengthen'd, splendid train
To regions far remote again
Reluctantly retire.

Their stretching tails portentous blaze
With terror and with wild amaze
The gazing nations fill,
Whilst bold astronomy explores
Their natures, periods, distance, pow'rs,
With scientific skill.

Eight hundred millions mete the space
From thee to flow-pac'd SATURN's place ;
A distance vast, immense !

Yet

Line 102.] From the last note it follows that comets or planets move quicker as they approach the Sun, and that their motion is retarded in receding from it.

Yet thrice ten thousand times as far
'Tis, ere we reach the nigheft star
That ftuds the blue expanfe.

In yonder Galaxy, 'tis true,
The heaps of ftars to mortal view
Form one continuous white;
Each ftar feems join'd to other's fide,
Yet fpaces no lefs vaft divide
Those twinklers of the night.

On clofer view, amazing fcene!
In every ftar a fun is feen,
Like thee as great, as bright;

Round

Line 115] I fhould be glad to fee
fome probable conjectures concerning
this phenomenon. One thing I infer
from it, which is this; that the univerfe,
or the creation, is finite, contrary to
the opinion of the celebrated Dr. Halley:

For if the univerfe, or the creation, were
infinite, as that great man fupposed, this
conglomeration of ftars in one part of the
heavens would not appear, but they
would feem pretty equally difpos'd all
around us.

Round each revolving planets roll,
Like earth illum'd, from pole to pole,
By floods of starry light. 126

Sudden sometimes a stranger star
Will in the azure plains appear,

But meteor-like soon ends:
Another system's Comets these,
Or are they Suns, whose feeble rays
With sooty crusts contend 132

Thus grand the wide Creation's reign,
Thus furnish'd the ethereal plain,
Still teeming with new birth:

Round

But

Line 130] Is not this conjecture probable? The common opinion is that these new stars are Suns, which having been suffocated and obscur'd for a time by copious fuliginous vapours, at length break through them, and shine out; but that their light is by degrees again overcome and suppress'd.

But what is this to boundless space,

Where worlds and matter have no place?

A garden to the earth. 138

NEWTON, immortal NEWTON, rose;

This mighty frame, its order, laws,

His piercing eye beheld:

That SUN of Science pour'd his streams,

All Darkness fled before his beams,

And Nature stood reveal'd. 144

By Man be Heaven's commands rever'd,

Be Nature, Reason, always heard,

Let these his actions rule:

So

Line 138] Whether the creation be finite or infinite, is a point yet agitated amongst the learned, as has been before observ'd: For my part, I believe it finite, and that, immense as the spot is which

creation has cultivated, it bears a far less proportion to infinite space, than a small garden, or even a grain of sand, does to the whole Earth.

So that his mind each day improve,
 Each day inspire celestial love,
 And sublimate his soul. 150

Though NEWTON's genius cloudless shone,
 Discover'd truths before unknown,
 By none before believ'd;
 The time will come when such shall know
 Much more than NEWTON ever knew,
 Than fancy e'er conceiv'd. 156

Yes, time a messenger shall send,
 Who shall all doubts and scruples end,
 And clearer views present;

When

Line 154] By *such* I mean they who live in the manner recommended in the preceding verse. Others, whose minds have acquir'd a contrary bent, may have no relish for these pleasures; and, for a punishment, may be immers'd deeper, and united more strongly to unactive matter hereafter, than they are in their present state of imprisonment.

Line 159] A desire of novelty, and thirst after knowledge is natural to the human mind; I therefore presume that the gratification thereof will be one of the pleasures of the blest'd: And what an ample field does the universe afford! How many ages would pass in barely informing ourselves of the number of worlds?

When quick as thought our posts we'll change,
 From World to World advent'rous range,
 Through all the wide extent. 162

----- But let us not, in wonder lost, forget
 The architect divine, -all-good, all-wise, all-powerful;
 Who spake to being this stupendous fabric,
 Bade spirit, matter, all from nothing rise,
 Stretch'd boundless *space*, and arch'd the azure skies;
 Plac'd every system, kindled every Sun,
 And bade each globe its destin'd circle run;

D

To

worlds? How many more in acquaint-
 ing ourselves with the forms, the nature,
 the employment of their several inhabi-
 tants? How many more still in enquir-
 ing into their revolutions and mutations,
 their antiquity and history, their arts
 and sciences? Thus we see the gratifi-
 cation of one single desire would require
 almost an eternity.—But who can de-
 scribe, or even conceive, the joys that will
 flow from the mutual love and benevo-
 lence, that will eternally and uninterrupt-
 edly reign amongst the Blessed, that is to
 say, amongst the spirits of the best of

men; and the best and greatest of every
 other class of rational beings?—And how
 vastly short will all this be of the unspeak-
 able happiness that will arise from a more
 intimate communication with, and a
 clearer perception of, the great and su-
 preme author of our and all other being!
 —Add to this, that in the new bodies we
 shall be clothed with, numberless inlets of
 pleasure and happiness may be open'd,
 that we can now have no more concep-
 tion of, than a man born blind can have
 of light, colours, or the pleasures of sight.

To every world its proper beings gave,
 With all that's needful to preserve and save:
 To thee, the origin of all, the greatest, best,
 Be all our love, our gratitude, our praise address! 173

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